

CLAIMS

1. A livestock identification tag assembly comprising:
 - (a) a heat seal laminate comprising:
 - (i) a first facestock having an upper surface and a lower surface;
 - (ii) a heat-activatable layer having an upper surface and a lower surface, wherein the upper surface of the heat-activatable layer is adhered to the lower surface of said facestock; and
 - (b) a flexible polymeric substrate, having an upper surface; wherein the lower surface of the heat-activatable of the laminate is bonded to the upper surface of the substrate; and
 - (c) identifying indicia positioned between the heat-activatable layer and the flexible substrate.
2. The livestock identification tag assembly of claim 1 wherein said facestock comprises a single-layered construction.
3. The livestock identification tag assembly of claim 1 wherein said facestock comprises a multi-layered construction.
4. The livestock identification tag assembly of claim 1 wherein said facestock comprises a polymeric film.
5. The livestock identification tag assembly of claim 1 wherein said facestock comprises a polyvinyl chloride film.
6. The livestock identification tag assembly of claim 1 wherein said heat-activatable layer comprises a heat-activatable adhesive or thermoplastic film selected from the group consisting of polyolefins, polyamides, polyester copolymers, polyurethanes, ionomers based on sodium or zinc

salts of ethylene methacrylic acid, polyacrylonitriles, ethylene-vinyl acetate copolymers, ethylene methacrylic acid, ethylene methyl acrylate, ethylene acrylic acid, ethylene ethyl acrylate and mixtures of two or more thereof.

5 7. The livestock identification tag assembly of claim 1 wherein the substrate is comprised of polyurethane.

8. The livestock identification tag assembly of claim 1 wherein the identifying indicia comprises a printed layer on the lower surface of said heat-activatable layer.

10 9. The livestock identification tag assembly of claim 1 wherein the identifying indicia comprises a printed layer on the upper surface of the substrate.

15 10. The livestock identification tag assembly of claim 1 wherein the identifying indicia comprises a radio frequency identification device.

11. The livestock identification tag assembly of claim 1 wherein the heat seal laminate further comprises a carrier layer overlying the upper surface of the facestock.

20 12. The livestock identification tag assembly of claim 11 wherein the carrier layer is adhered to the upper surface of the facestock by a laminating adhesive layer.

13. The livestock identification tag assembly of claim 1 wherein the heat seal laminate further comprises a detach layer adhered to the lower surface of said heat-activatable layer.

25 14. The livestock identification tag assembly of claim 1 wherein the heat seal laminate further comprises a second facestock layer having an upper and lower surface, wherein the lower

surface of the second facestock layer is bonded to the upper surface of the substrate, and wherein the first facestock overlies the second facestock layer and the heat-activatable layer is adhered to the second facestock layer.

5 15. The livestock identification tag assembly of claim 14 wherein the heat seal laminate further comprises a radiation curable adhesive layer overlying the second facestock layer.

 16. The livestock identification tag assembly of claim 14 wherein the upper surface of said second facestock layer is imprinted with identifying indicia.

10 17. The livestock identification tag assembly of claim 14 wherein the said second facestock layer is bonded to the upper surface of the substrate by a second heat-activatable layer.

 18. The livestock identification tag assembly of claim 16 wherein identifying indicia, different from the identifying indicia printed on the second facestock, is positioned on the upper surface of the substrate.

 19. The livestock identification tag assembly of claim 1 further comprising a tie layer between the heat-activatable layer and the first facestock layer.

20 20. A heat seal laminate comprising:
 a first facestock having an upper surface and a lower surface;
 a heat-activatable layer adhered to said lower surface of said facestock;
 a laminating adhesive overlying said upper surface of said facestock; and
25 a carrier layer adhered to said laminating adhesive layer.

21. The heat seal laminate of claim 20 wherein said facestock comprises a single layer construction.

22. The heat seal laminate of claim 20 wherein said facestock comprises a multi-layered construction.

23. The heat seal laminate of claim 20 wherein said heat-activatable layer is comprised of a heat-activatable adhesive or thermoplastic film selected from the group consisting of polyolefins, polyamides, polyester copolymers, polyurethanes, ionomers based on sodium or zinc salts of ethylene methacrylic acid, polyacrylonitriles, ethylene-vinyl acetate copolymers, ethylene methacrylic acid, ethylene methyl acrylate, ethylene acrylic acid, ethylene ethyl acrylate and mixtures of two or more thereof.

24. The heat seal laminate of claim 20 wherein said heat-activatable layer comprises a polyurethane based adhesive.

25. The heat seal laminate of claim 20 wherein said facestock is comprised of a polyvinyl chloride film.

26. The heat seal laminate of claim 20 wherein said laminating adhesive is comprised of a radiation-cured adhesive material or a removable pressure-sensitive adhesive material.

27. The heat seal laminate of claim 20 wherein said laminating adhesive is comprised of a radiation-cured adhesive material.

28. The heat seal laminate of claim 20 further comprising a layer of ink or graphics printed on the lower surface of the heat-activatable layer.

29. The heat seal laminate of claim 20 further comprising a detach layer having an upper surface and a lower surface, the upper surface of said detach layer adhered to the lower surface of the heat-activatable layer.

30. The heat seal laminate of claim 29 further comprising a layer of ink or graphics printed on the lower surface of said detach layer.

31. The heat seal laminate of claim 20 further comprises a second facestock layer having an upper and lower surface, wherein the lower surface of the second facestock layer is bonded to the upper surface of the substrate, and wherein the first facestock overlies the second facestock layer and the heat-activatable layer is adhered to the second facestock layer.

32. The heat seal laminate of claim 31 further comprising a radiation curable adhesive layer overlying the second facestock layer.

33. The heat seal laminate of claim 31 wherein the upper surface of said second facestock layer is printed with identifying indicia.

34. The heat seal laminate of claim 33 wherein identifying indicia, different from the identifying indicia printed on the second substrate, is adhered to the lower surface of the heat-activatable layer.

35. A process for making a livestock identification tag assembly comprising:

- (a) providing a heat seal laminate comprising
 - a facestock having an upper surface and a lower surface;

a heat-activatable layer adhered to said lower surface of said facestock, said heat-activatable layer having an upper and lower surface;
a laminating adhesive overlying said upper surface of said facestock; and
a carrier layer adhered to said laminating adhesive layer;

- 5 (b) providing a flexible polymeric substrate having an upper surface;
(c) contacting the lower surface of the heat-activatable layer with the upper surface of the flexible substrate; and
(d) applying heat and pressure to the heat seal laminate to soften or melt the heat-activatable layer and adhere the heat seal laminate to the flexible substrate.

10 36. The process of claim 35 wherein the upper surface of said flexible polymeric substrate has an ink or graphics layer adhered thereto.

15 37. The process of claim 35 wherein the heat seal laminate further comprises a layer of ink or graphics adhered to or printed on the lower surface of and said heat-activatable layer.

38. The process of claim 35 wherein the flexible substrate comprises polyurethane.

39. The process of claim 35 further comprising:

- 20 (e) removing the carrier layer and laminating adhesive layer;
(f) printing identifying indicia onto the upper surface of the facestock layer;
(g) providing a second heat seal laminate comprising
a second facestock having an upper surface and a lower surface;
a second heat-activatable layer adhered to the lower surface of the second facestock,
25 said heat-activatable layer having an upper and lower surface;
a second laminating adhesive overlying said upper surface of said second facestock;
and

a second carrier layer adhered to said second laminating adhesive layer;

(h) contacting the lower surface of the second heat activatable layer with the upper surface of the first facestock and upper surface of the flexible substrate; and

5 (i) applying heat and pressure to the second heat seal laminate to soften or melt the second heat-activated layer and adhere the second heat seal laminate to the flexible substrate and enclose the first heat seal laminate.

10 40. The process of claim 39 wherein the second heat seal laminate further comprises identifying indicia, different from the identifying indicia printed on the second facestock, on the lower surface of the second heat-activated layer.